
Rochester group meeting

10/18/04

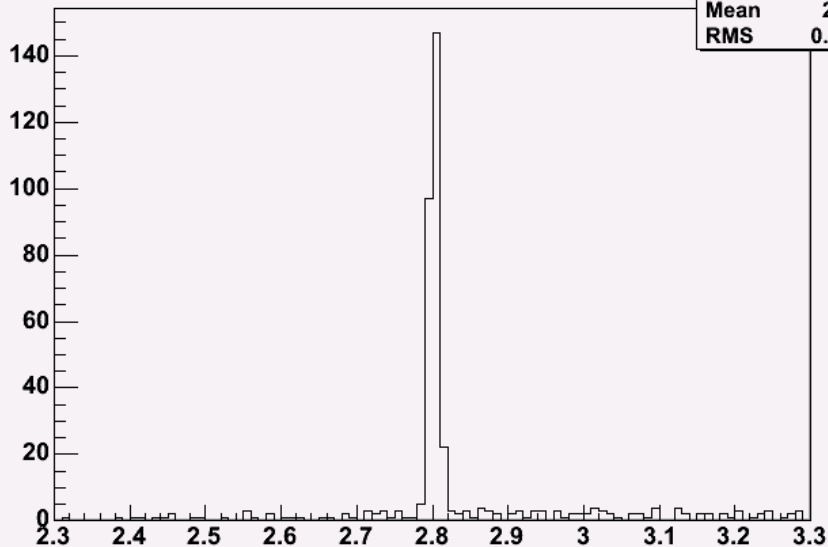
Geumbong Yu

DsP BSTNtuple MC

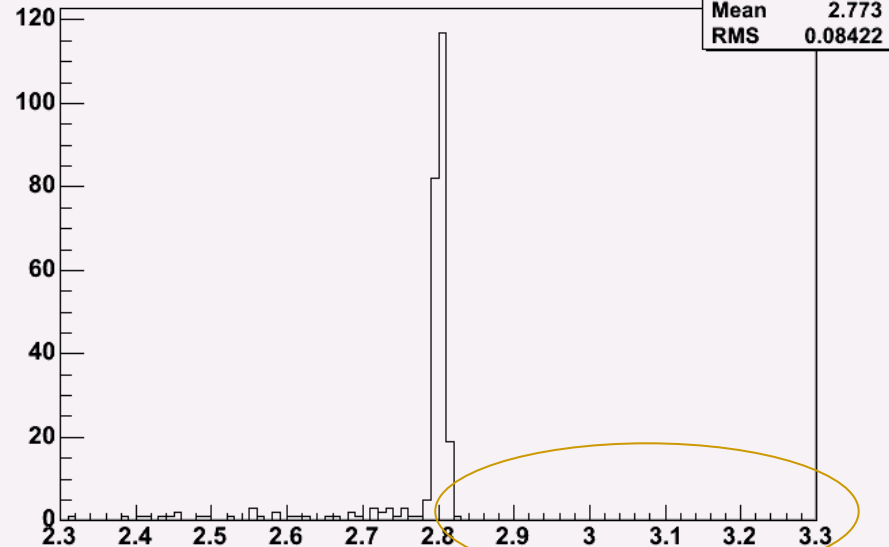
Standard cuts applied.

Momentum selection.
Proton mom. > Pion mom.

M(PQ) good, selected, BSTN



M(PQ) good, selected, BSTN, mom

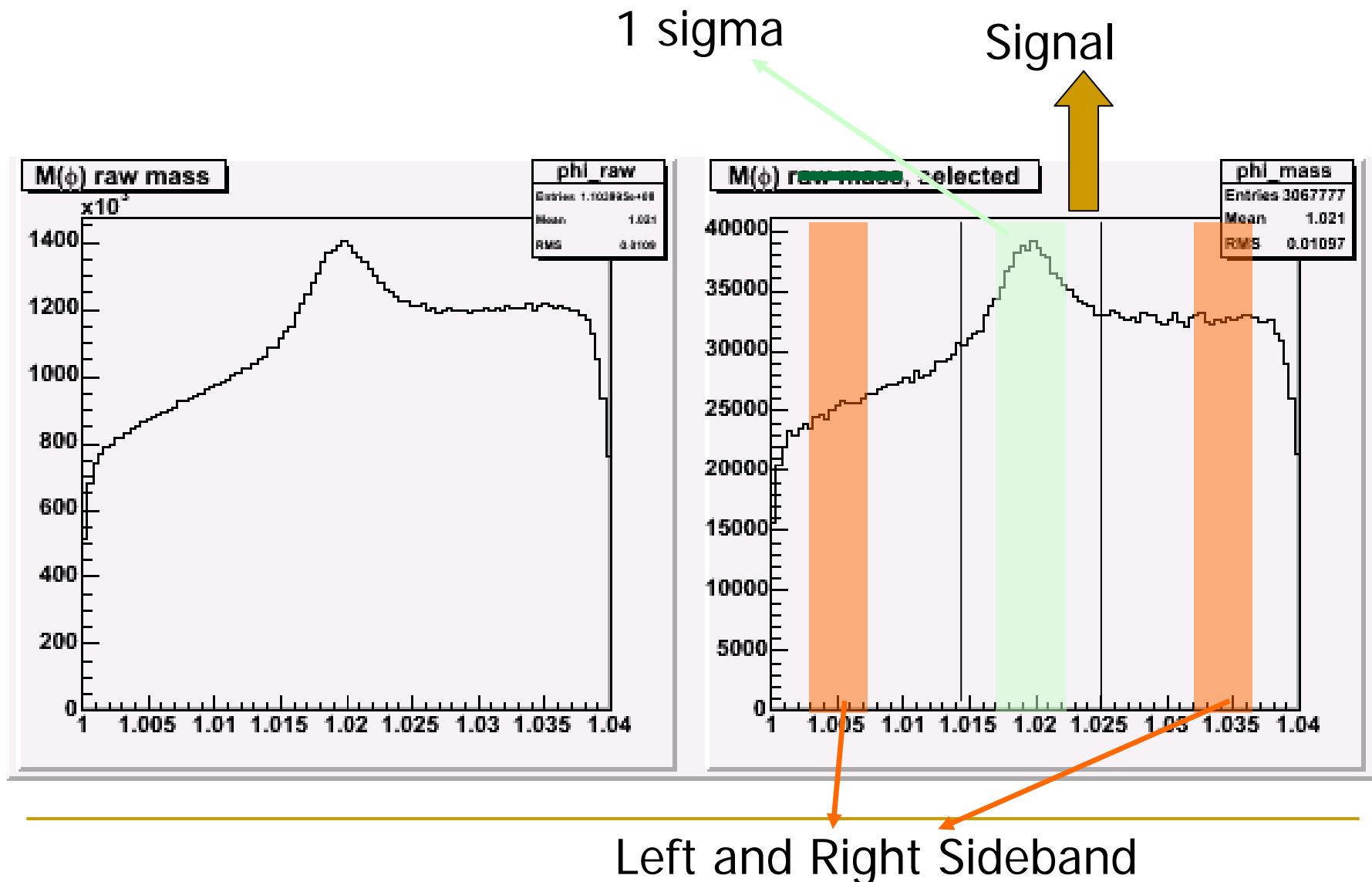


Momentum selection gives bias to PQ MC signal.

Standard Cuts(PhiPPi)

- TTT requirement for any two tracks out of 4 tracks
- PQ(D0) $\chi^2 \leq 20$
- PQ(D0) $L_{xy} \geq 550 \mu\text{m}$
- PQ(D0) $P_t \geq 6.5 \text{ GeV}$
- PQ(D0) $d_0 \leq 80 \mu\text{m}$
- These cuts were already optimized for D0- \rightarrow Phi Pi Pi decay mode.

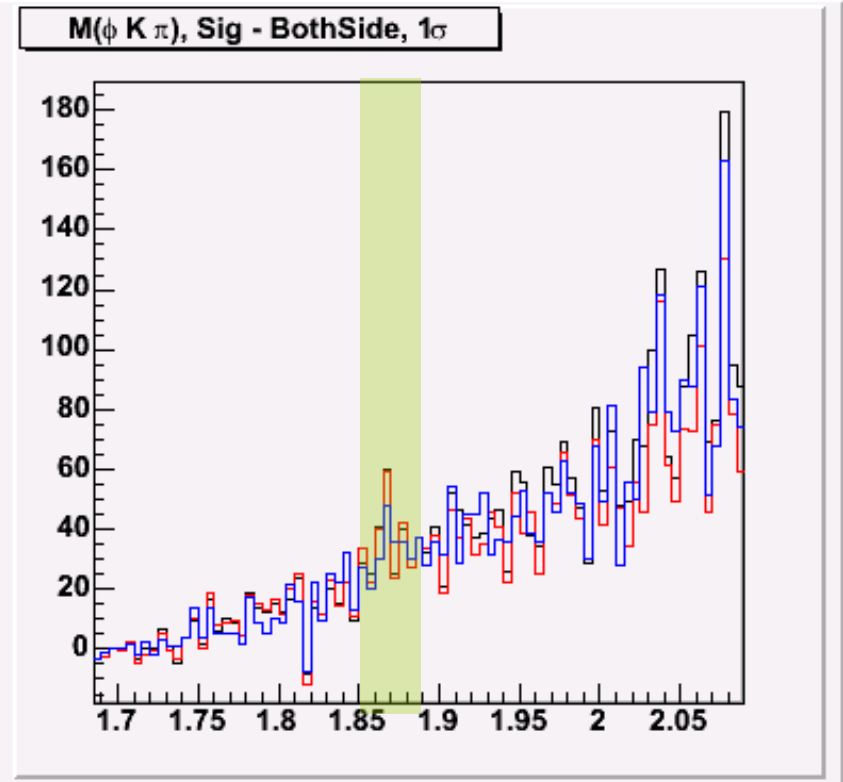
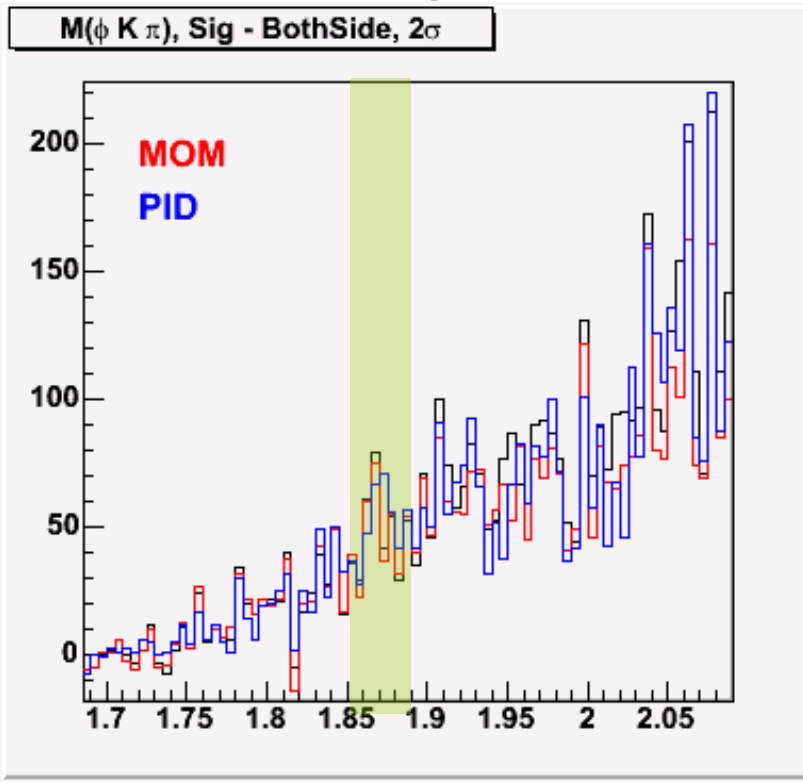
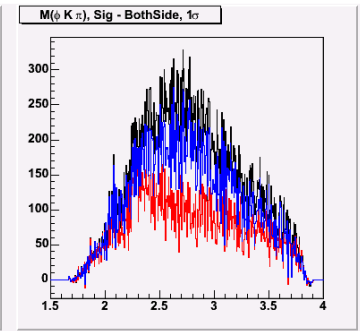
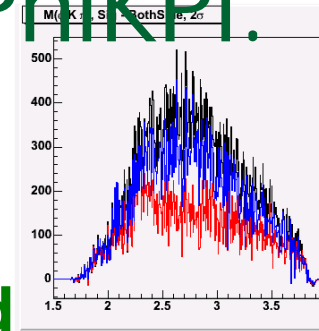
Phi mass



Comparison of momentum selection and Kaon PID cuts on $\Phi K \pi$.

Momentum selection cuts many events, but not efficient for D0. PID(KLike > 0.2) doesn't help.

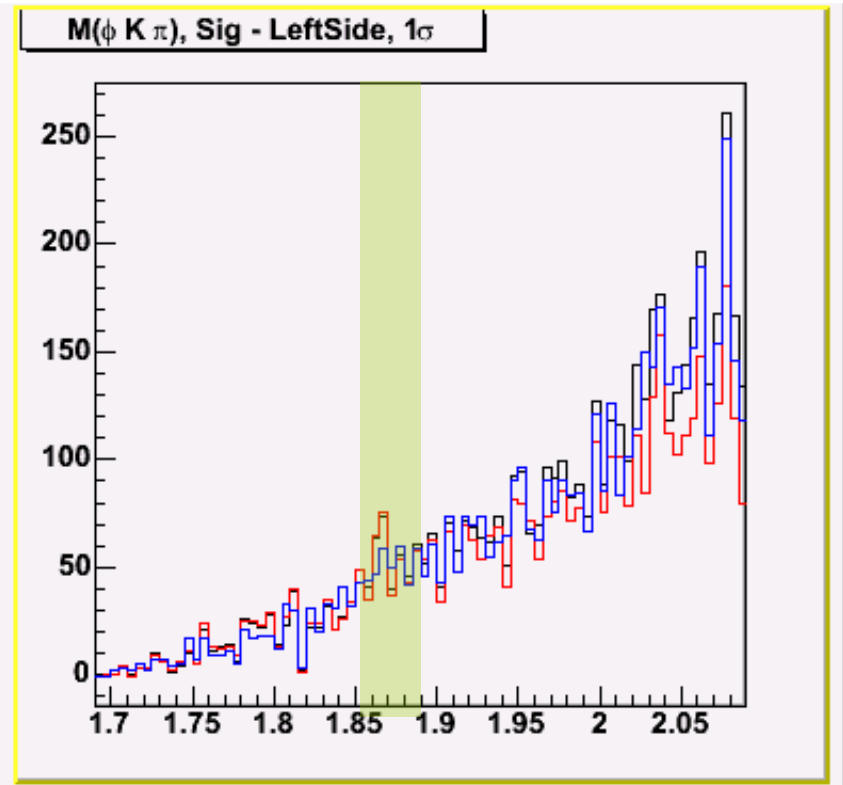
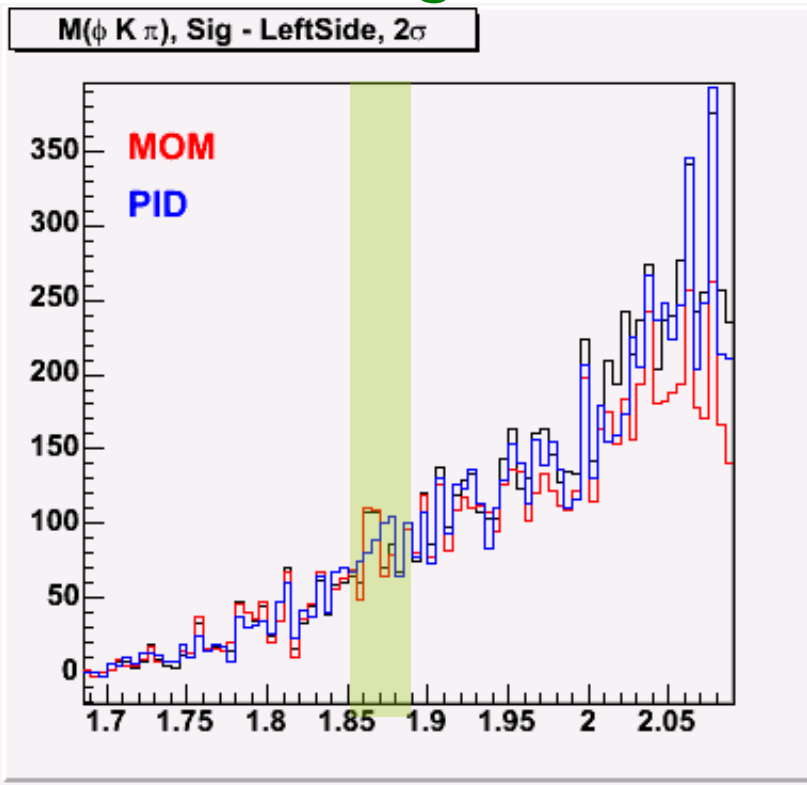
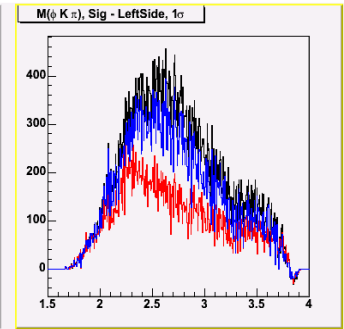
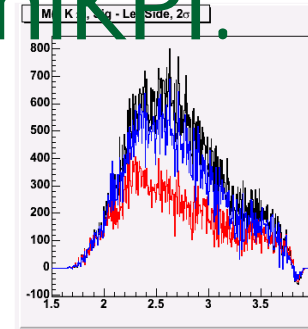
Signal – Both sideband



Comparison of momentum selection and Kaon PID cuts on $\Phi K \pi$.

Momentum selection cuts many events, but not efficient for D^0 . $PID(K_{\text{Like}} > 0.2)$ doesn't help.

Signal – Left sideband

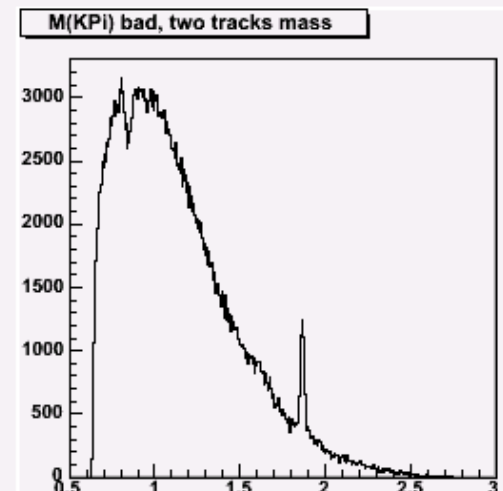
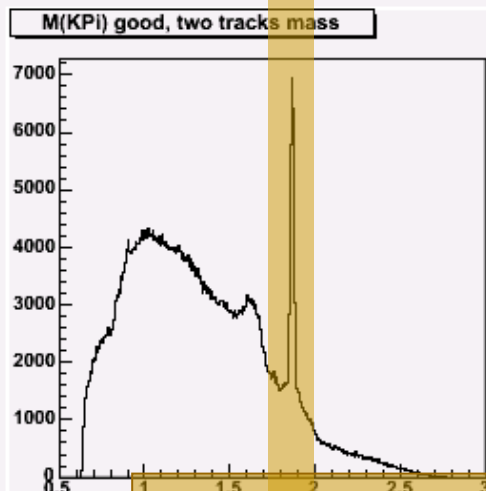
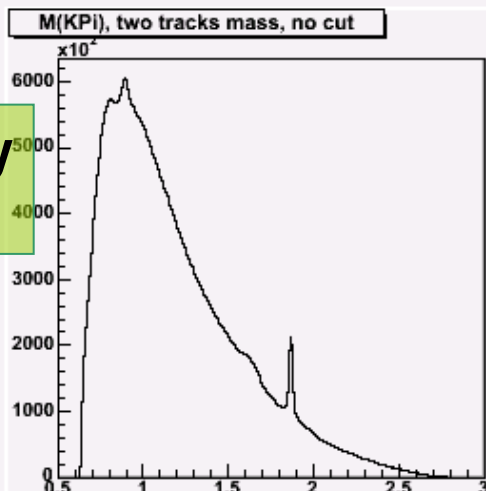
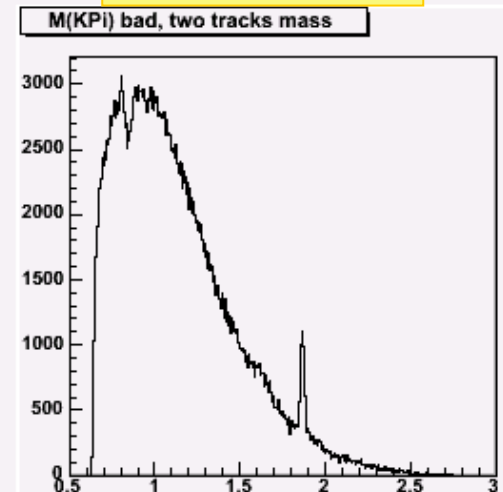
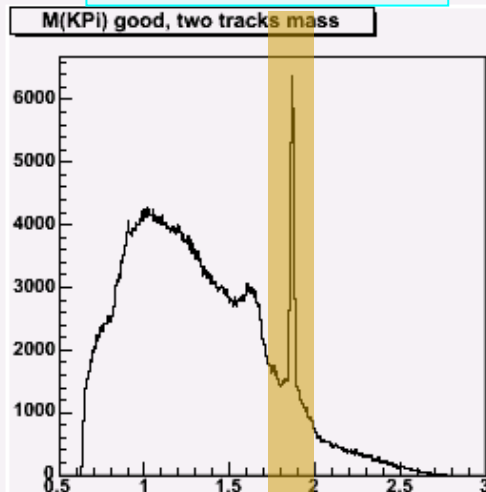
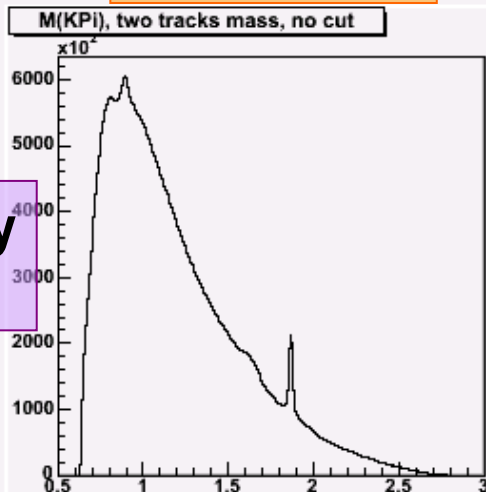


Two track mass(KPi)

Raw mass

Good cand.

Bad cand.



D0 -> K Pi

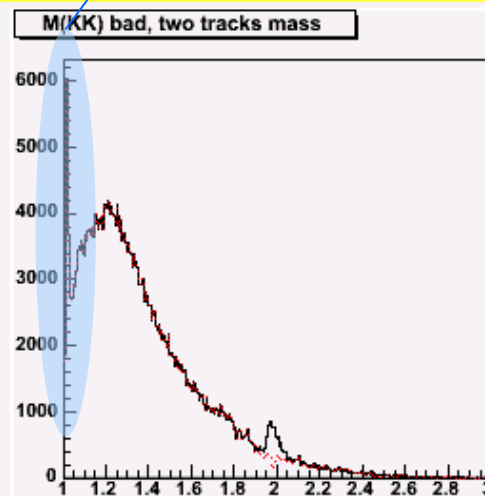
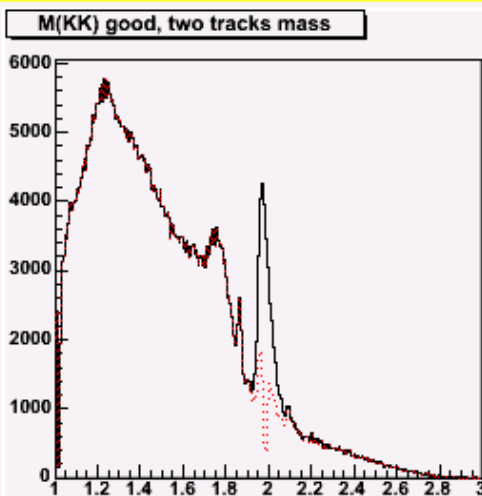
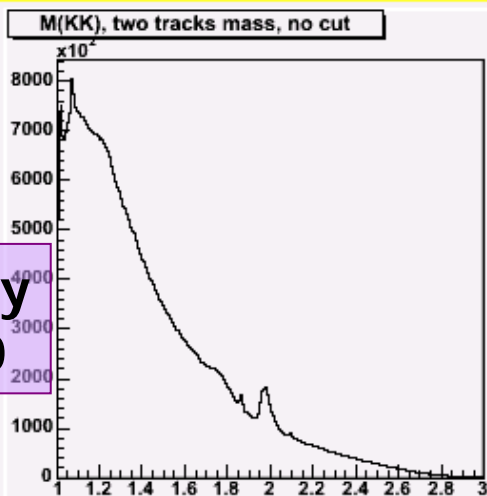
PQ Lxy
> 550

PQ Lxy
> 100

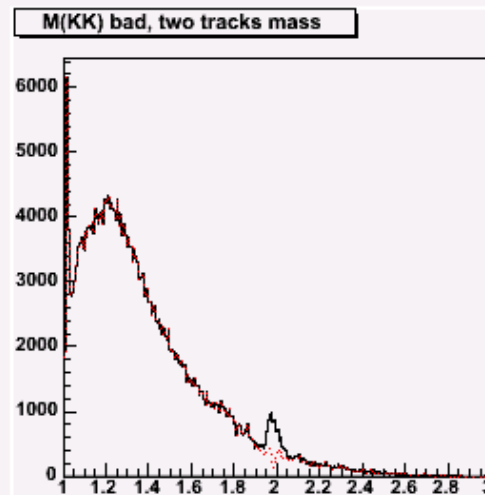
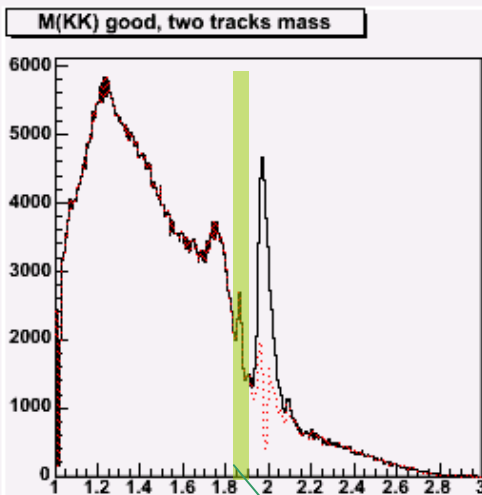
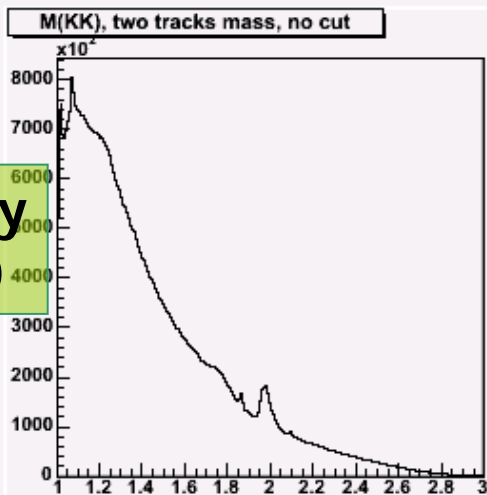
Two track mass(KK)

Phi -> KK in bad event
Phi come out with
Pion track.

PQ Lxy
> 550



PQ Lxy
> 100



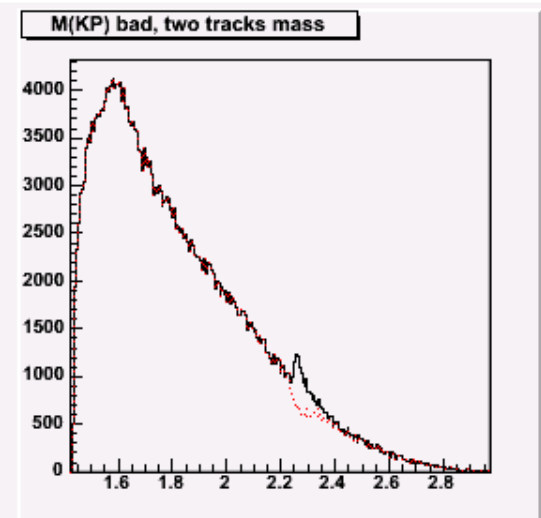
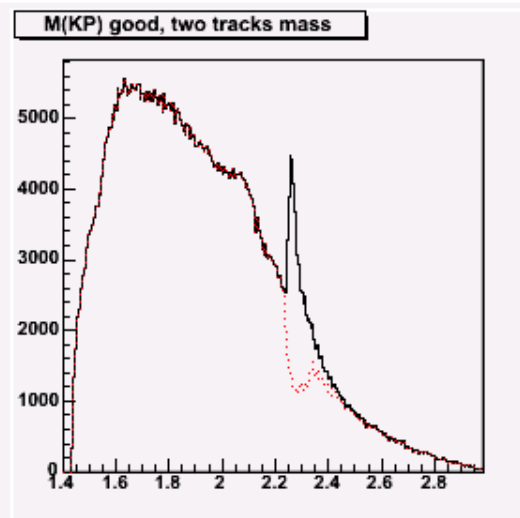
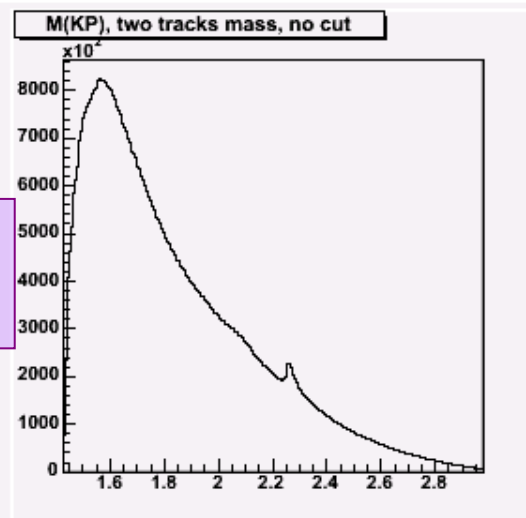
With and Without $D0 \rightarrow K\pi$

$D0 \rightarrow KK$

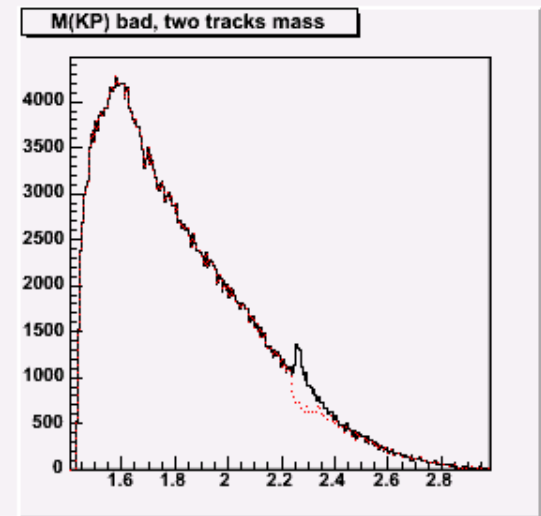
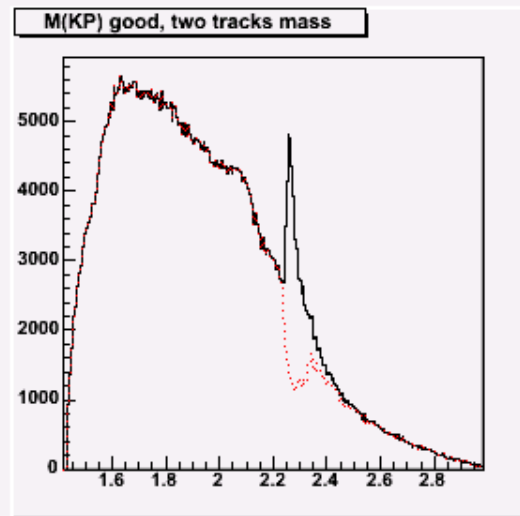
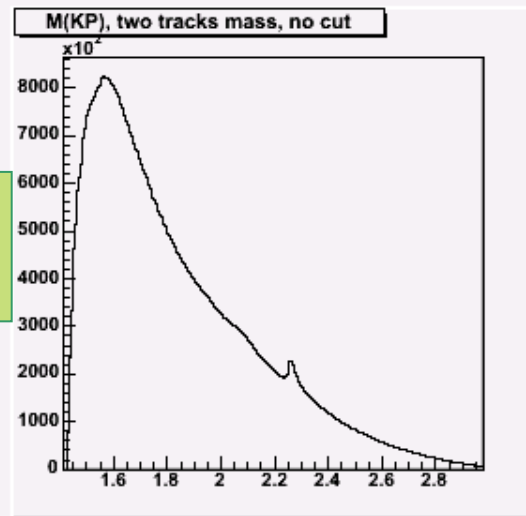
Two track mass(KP)

With and **Without** $D0 \rightarrow K\pi$

PQ Lxy
> 550



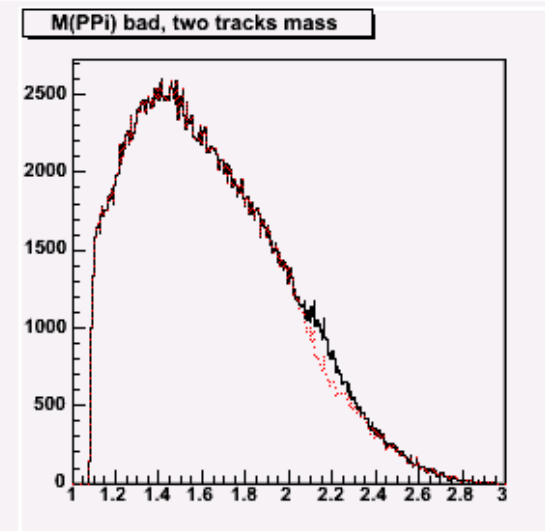
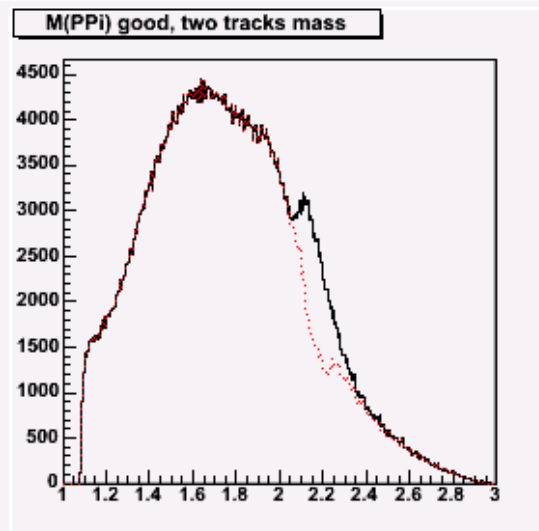
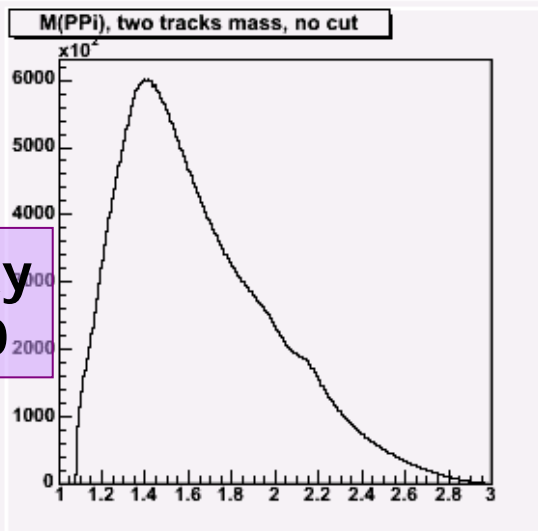
PQ Lxy
> 100



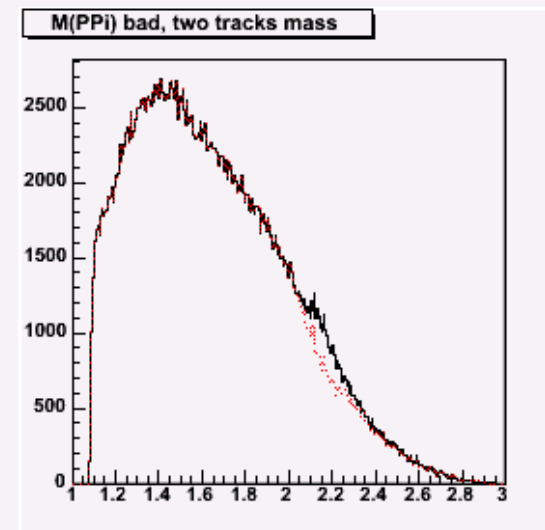
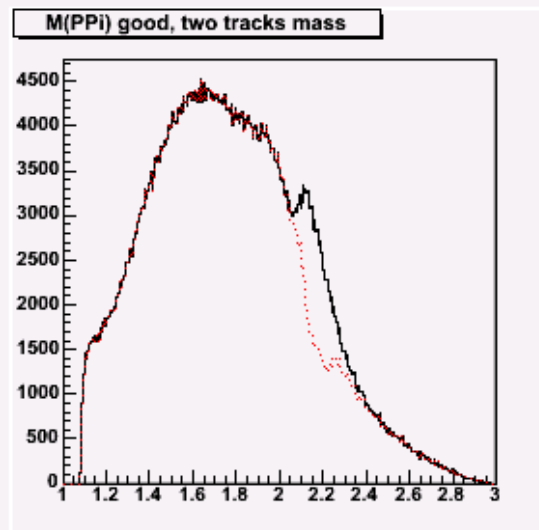
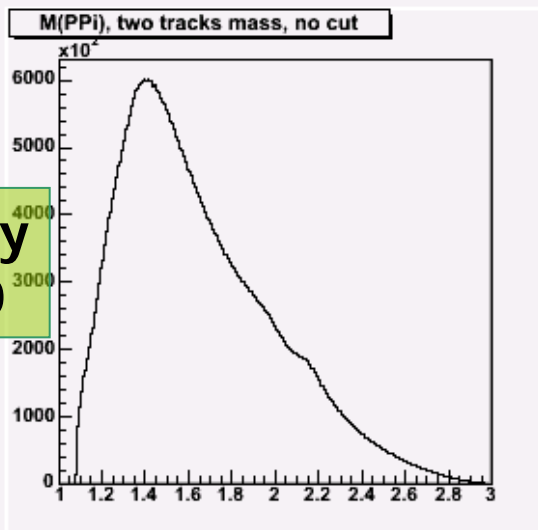
Two track mass(PPi)

With and **Without** $D0 \rightarrow K\pi$

PQ Lxy
> 550



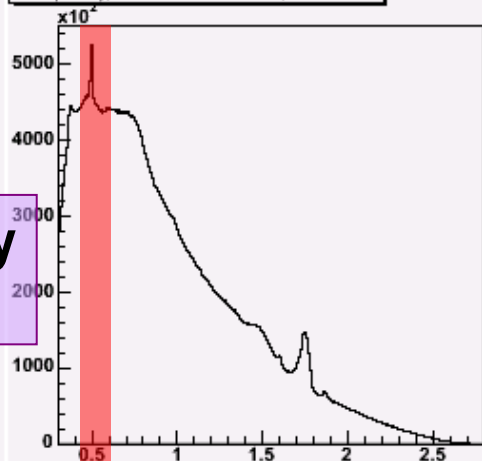
PQ Lxy
> 100



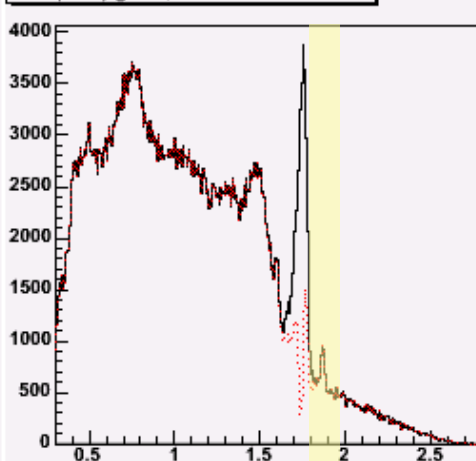
Two track mass(PiPi)

With and **Without** $D0 \rightarrow K\pi$

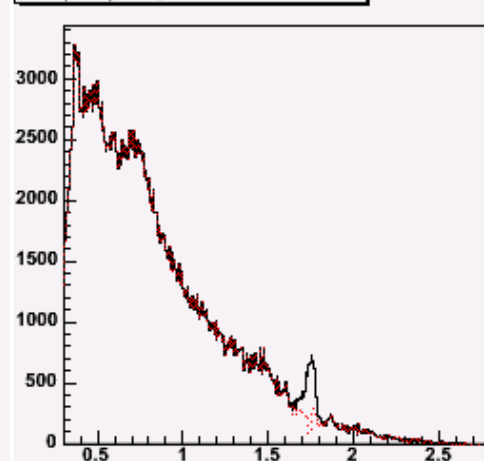
M(PiPi), two tracks mass, no cut



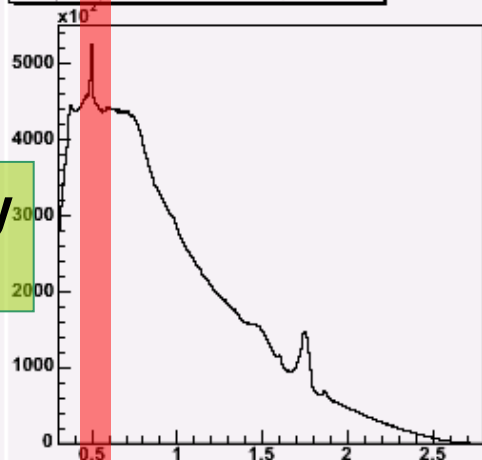
M(PiPi) good, two tracks mass



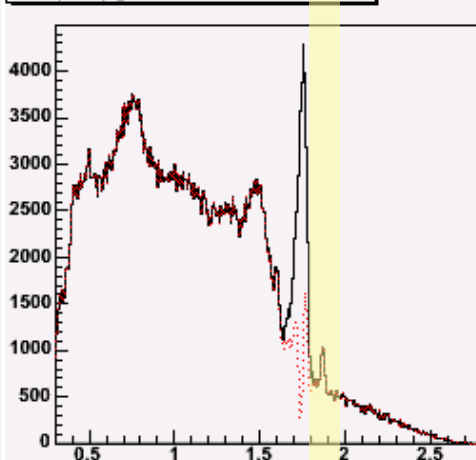
M(PiPi) bad, two tracks mass



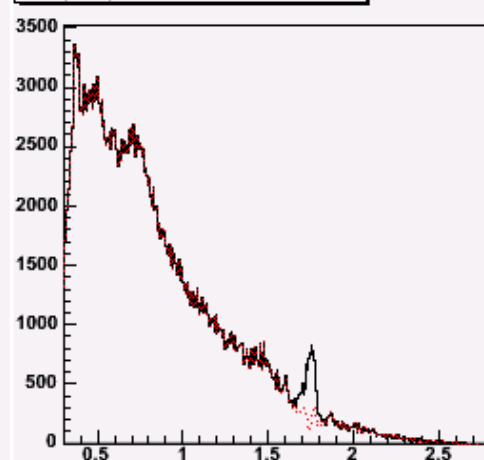
M(PiPi), two tracks mass, no cut



M(PiPi) good, two tracks mass



M(PiPi) bad, two tracks mass



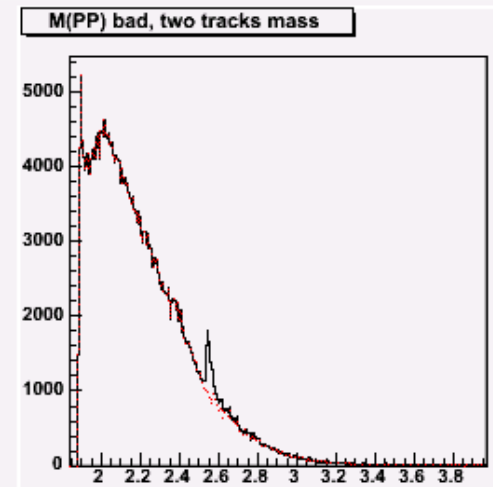
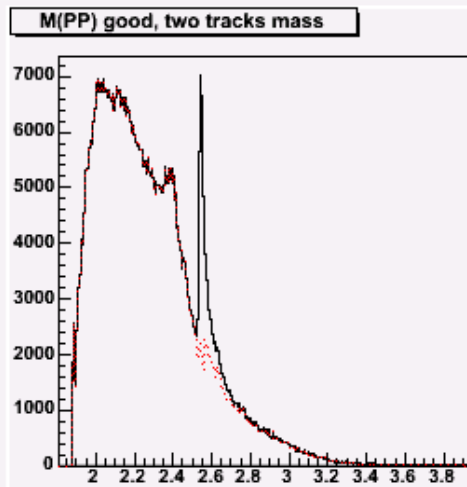
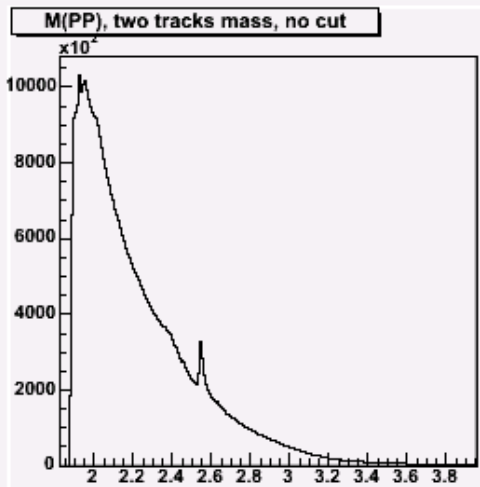
$K_s \rightarrow \pi \pi$

$D0 \rightarrow \pi \pi$

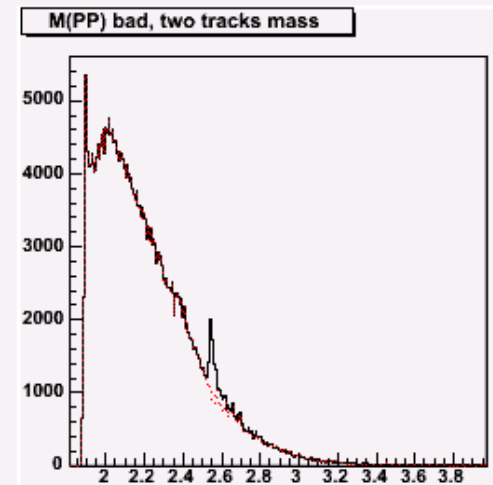
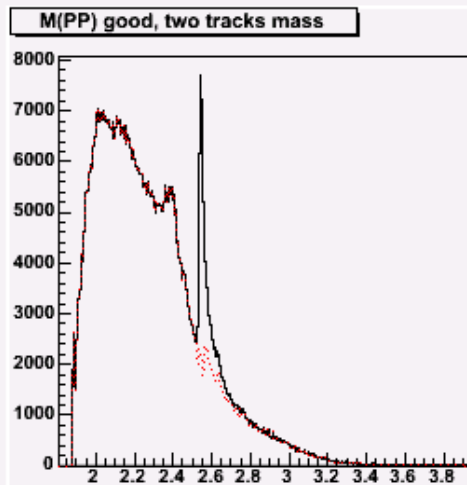
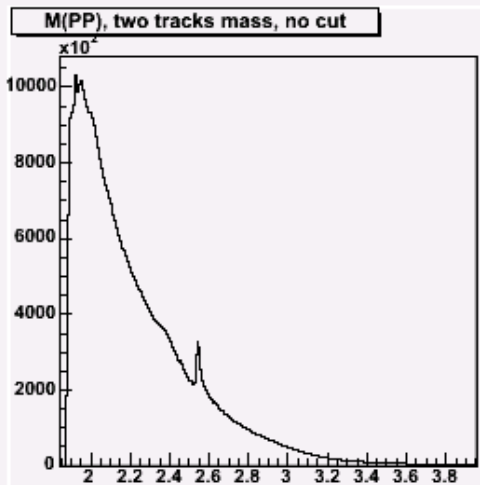
Two track mass(PP)

With and **Without** $D0 \rightarrow K\pi$

PQ Lxy
> 550



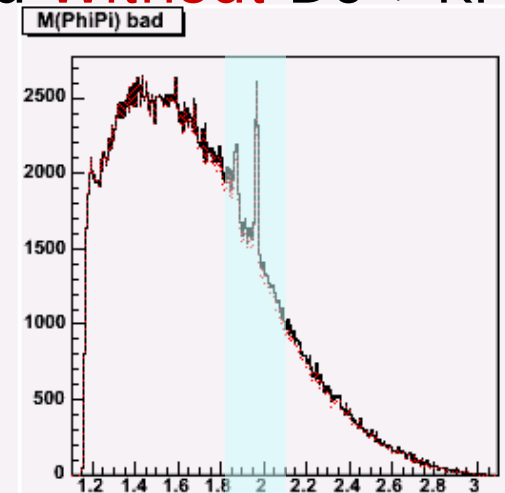
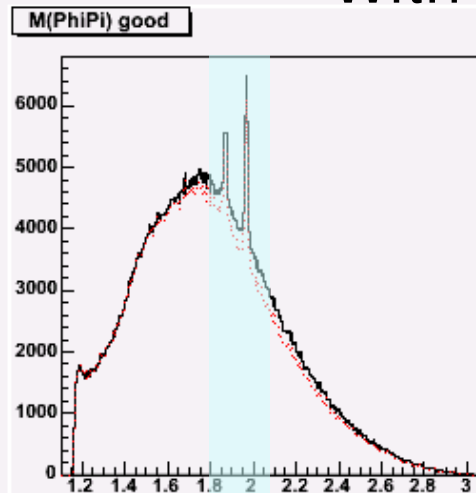
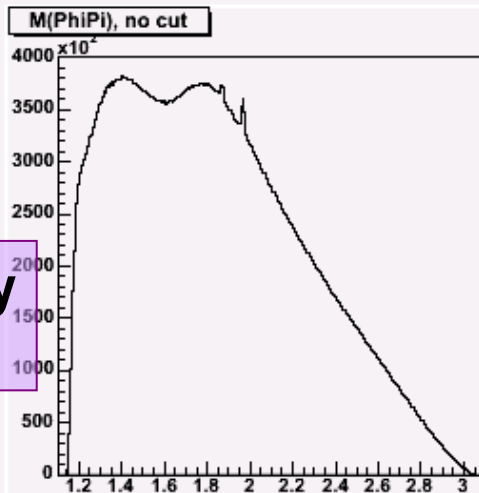
PQ Lxy
> 100



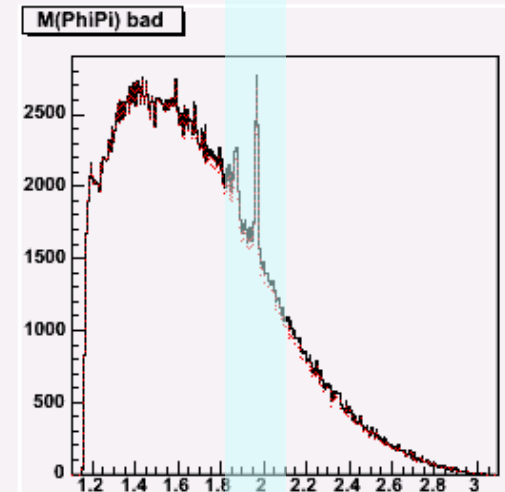
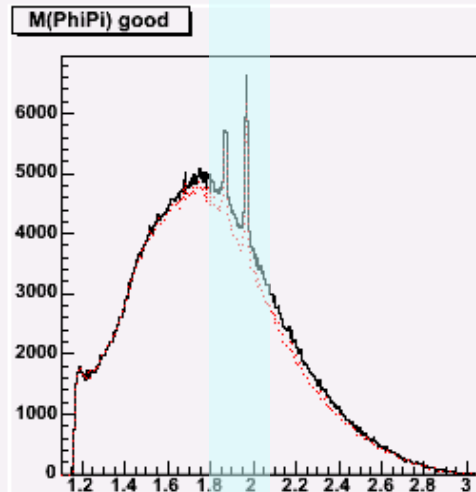
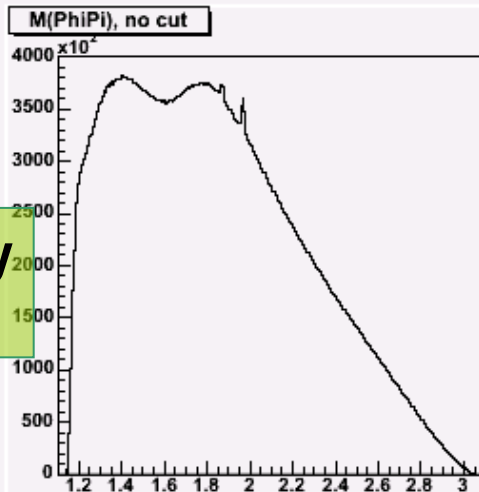
Phi + track(PhiPi)

With and **Without** $D0 \rightarrow K\pi$

PQ Lxy
> 550



PQ Lxy
> 100

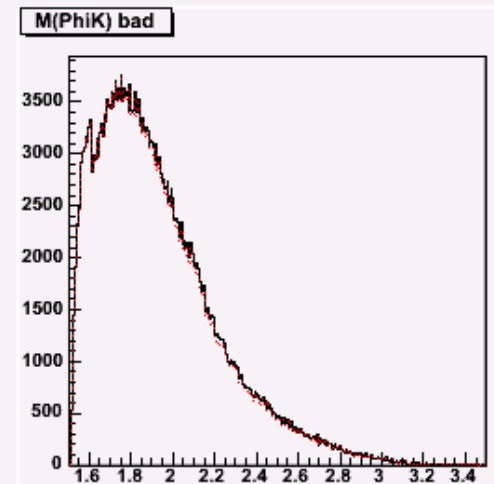
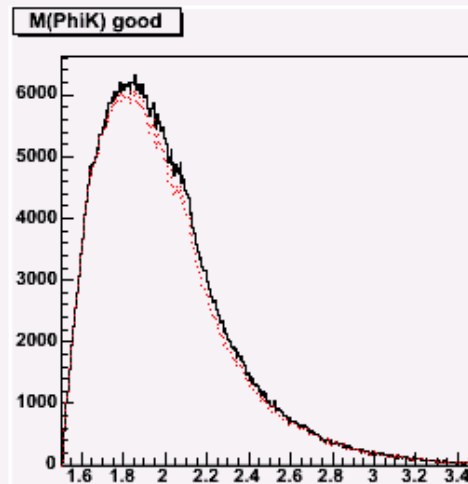
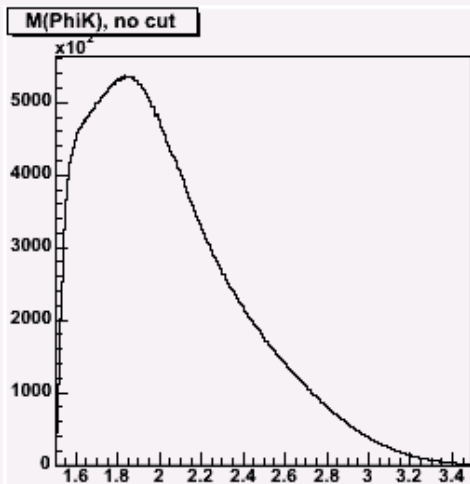


$D0, Ds \rightarrow \Phi \pi$

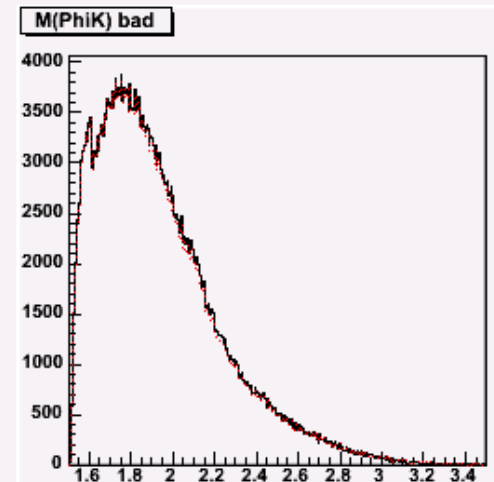
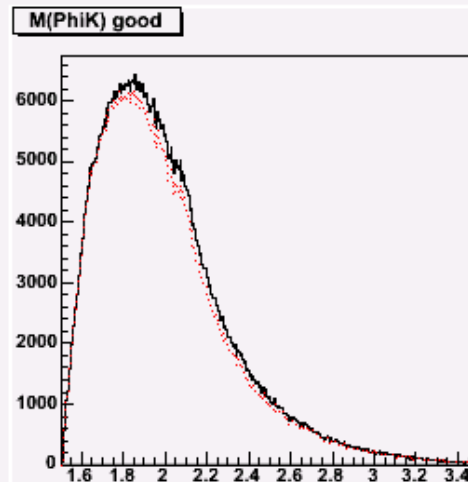
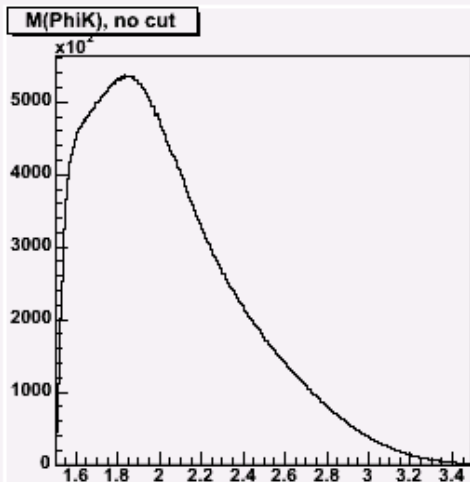
Phi + track(PhiK)

With and **Without** D0->KPi

PQ Lxy
> 550



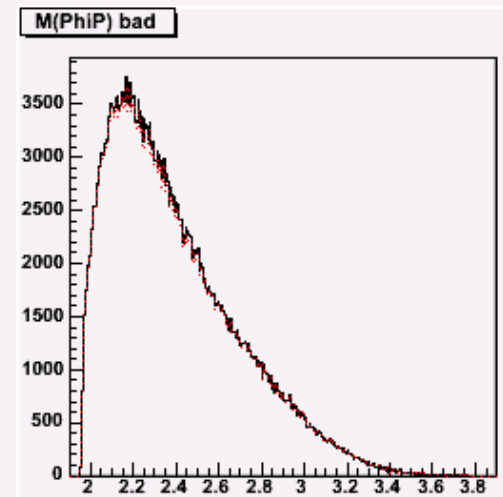
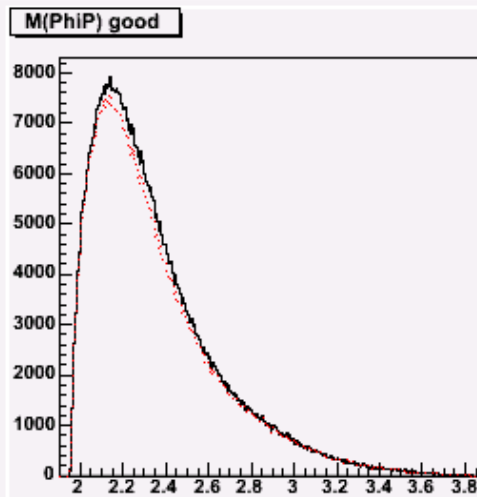
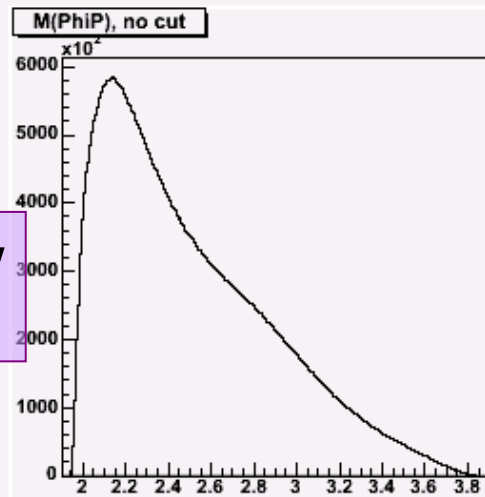
PQ Lxy
> 100



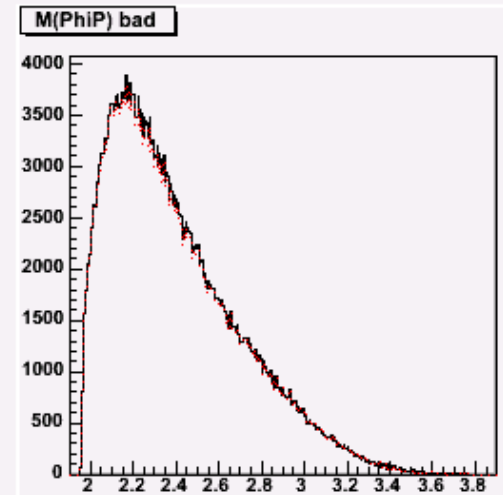
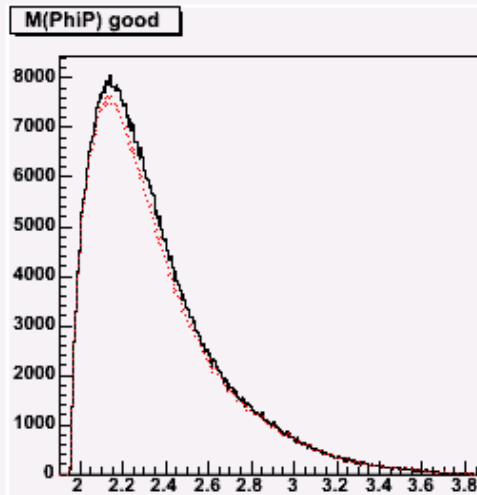
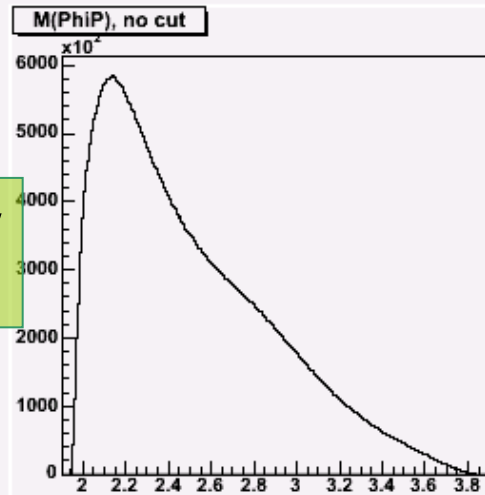
Phi + track(PhiP)

With and **Without** $D^0 \rightarrow K\pi$

PQ Lxy
> 550



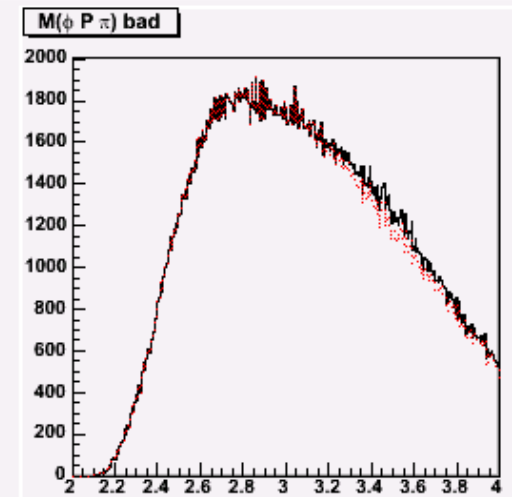
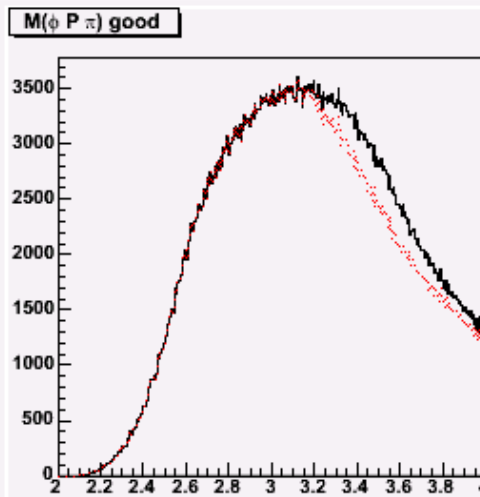
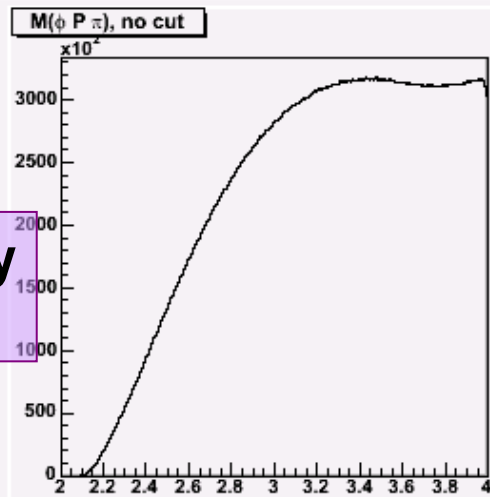
PQ Lxy
> 100



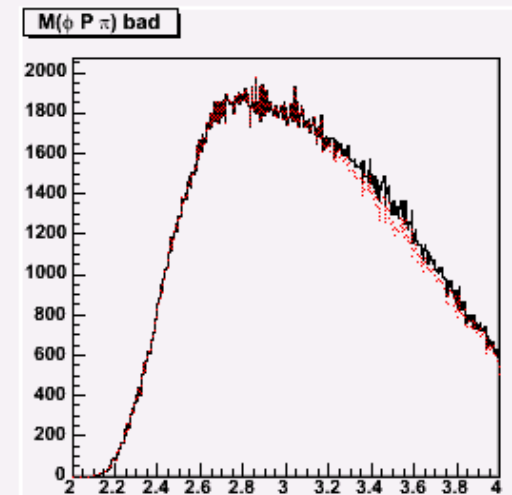
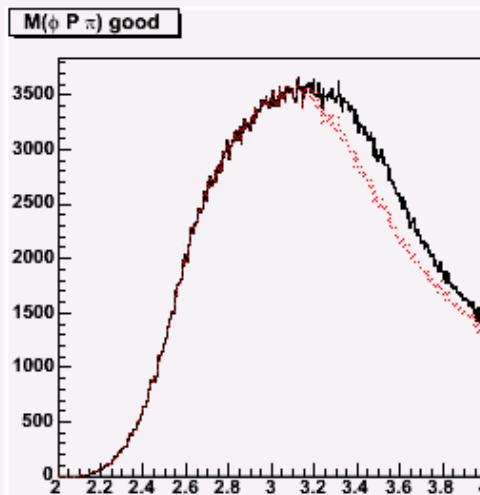
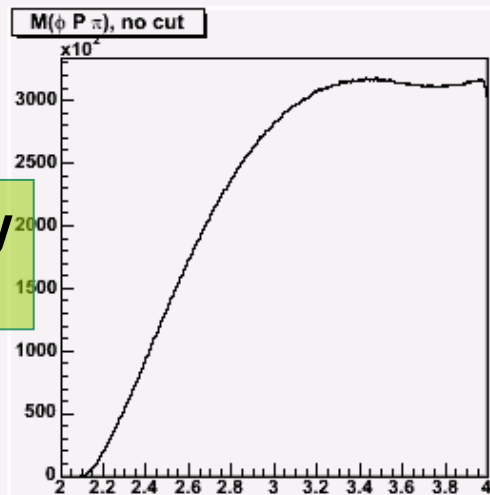
Phi P Pi

With and **Without** $D^0 \rightarrow K \pi$

PQ Lxy
> 550



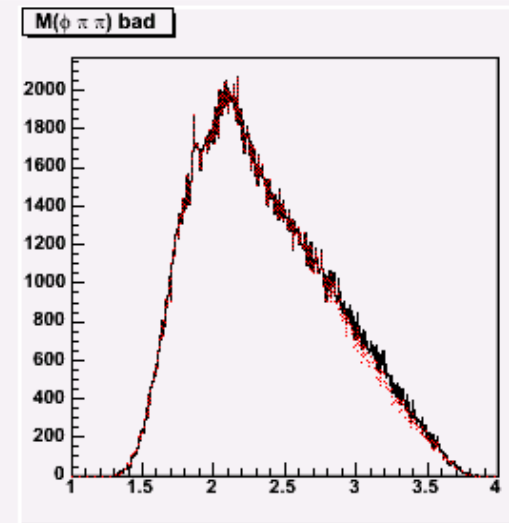
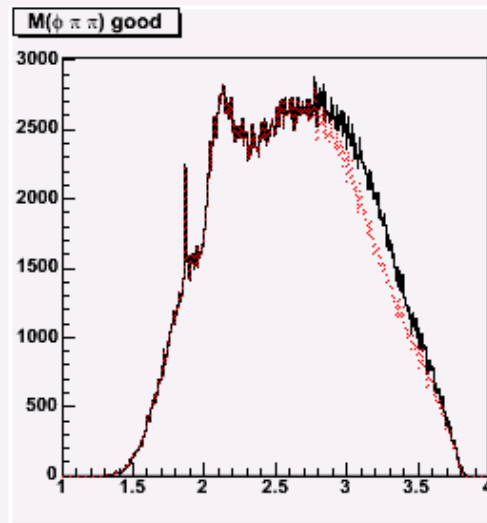
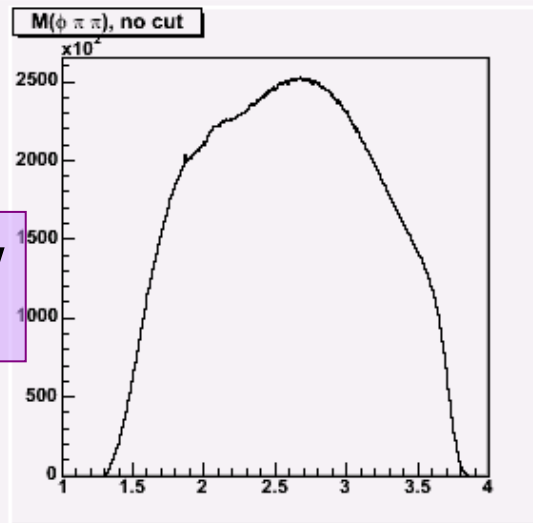
PQ Lxy
> 100



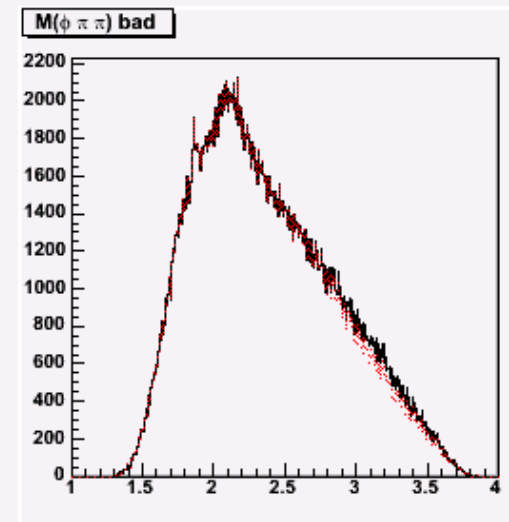
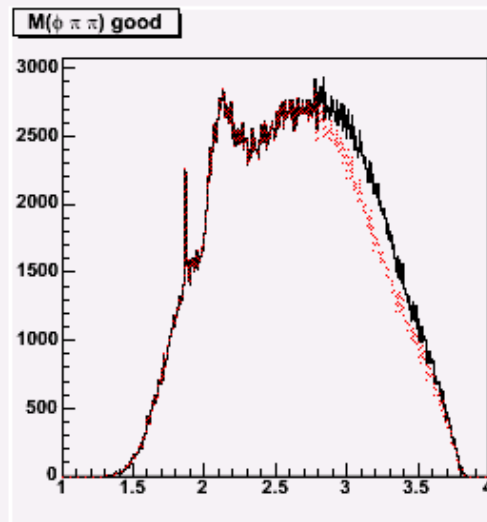
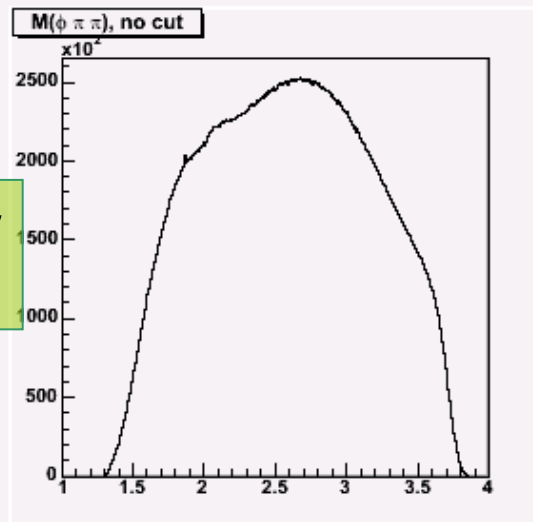
Phi Pi Pi

With and **Without** $D^0 \rightarrow K\pi$

PQ Lxy
> 550



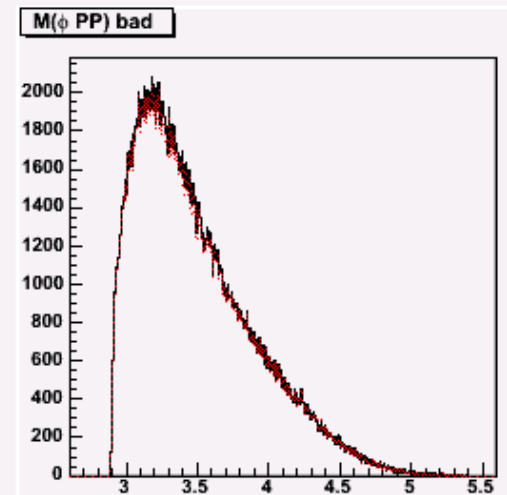
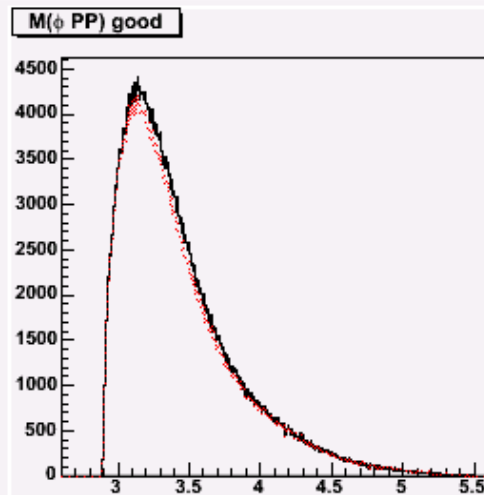
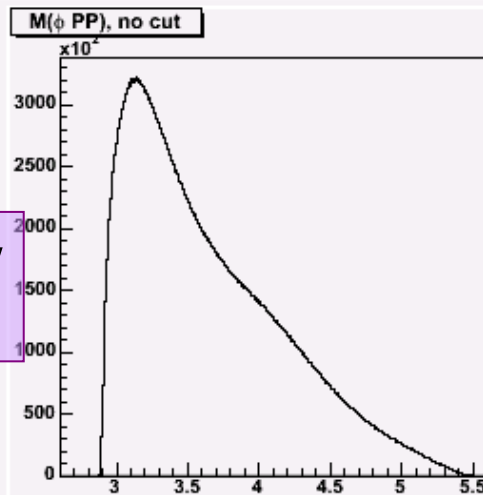
PQ Lxy
> 100



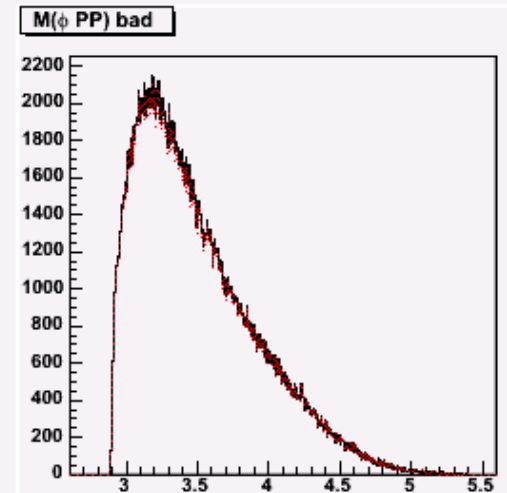
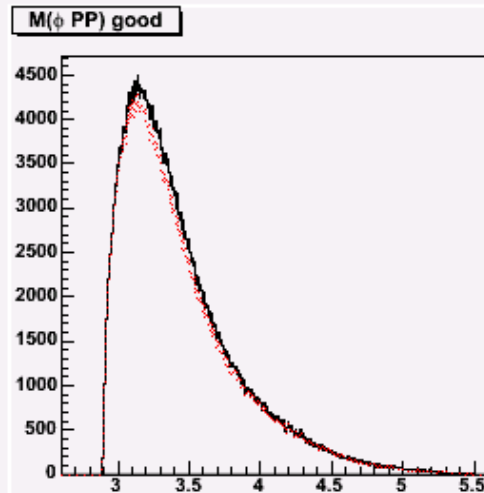
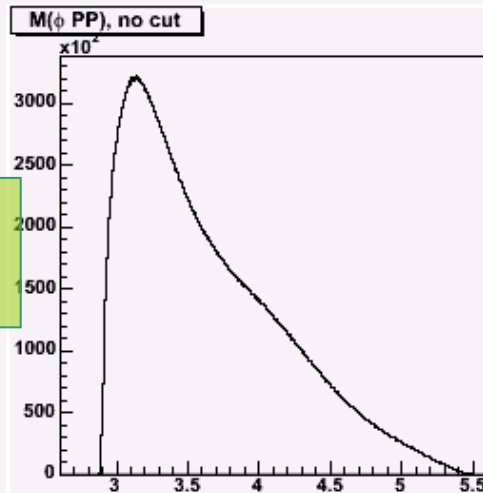
Phi P P

With and **Without** $D^0 \rightarrow K\pi$

PQ Lxy
> 550



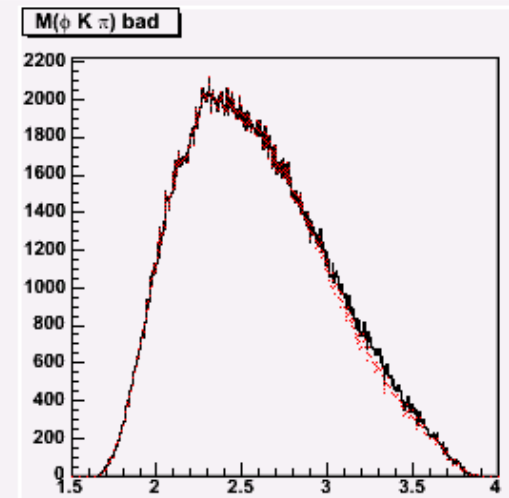
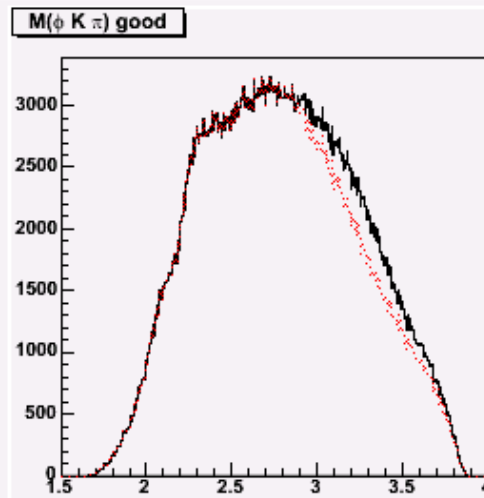
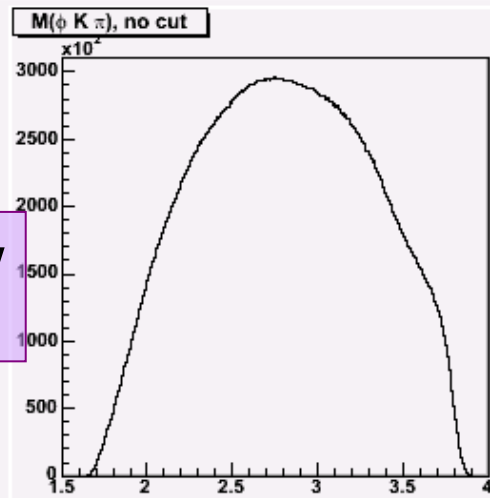
PQ Lxy
> 100



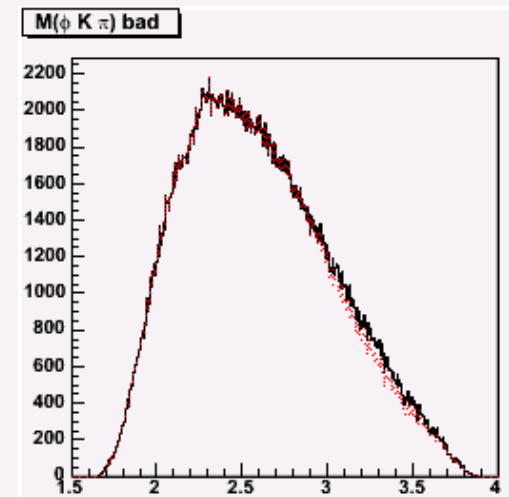
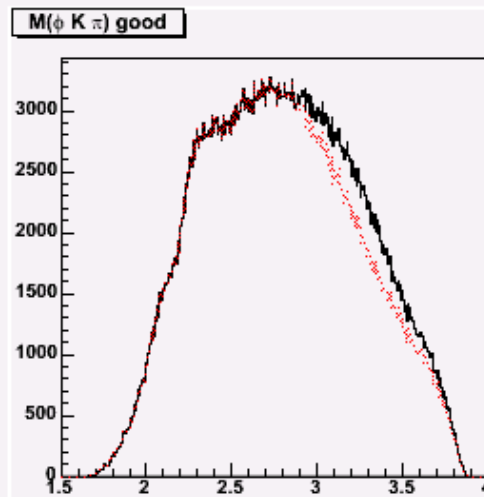
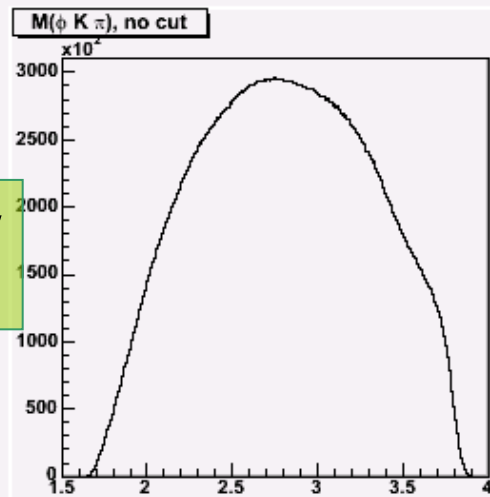
Phi K Pi

With and **Without** $D^0 \rightarrow K\pi$

PQ Lxy
> 550



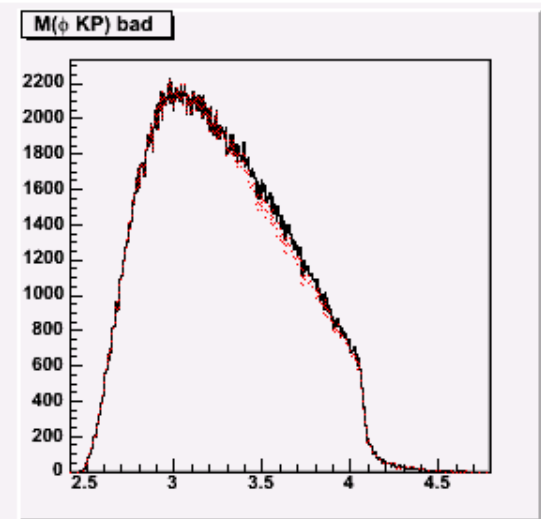
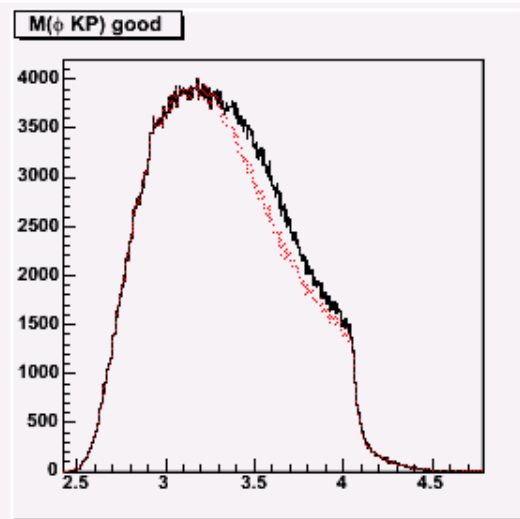
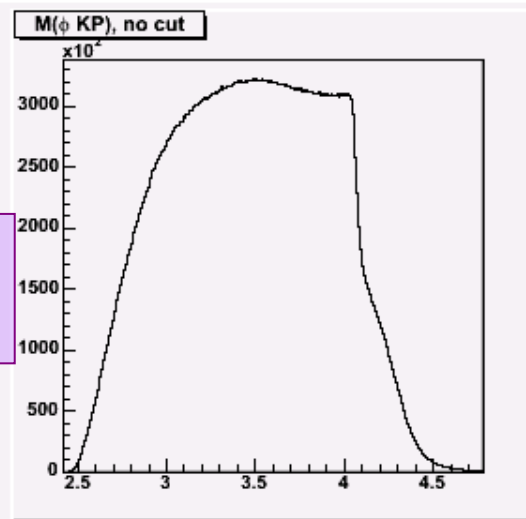
PQ Lxy
> 100



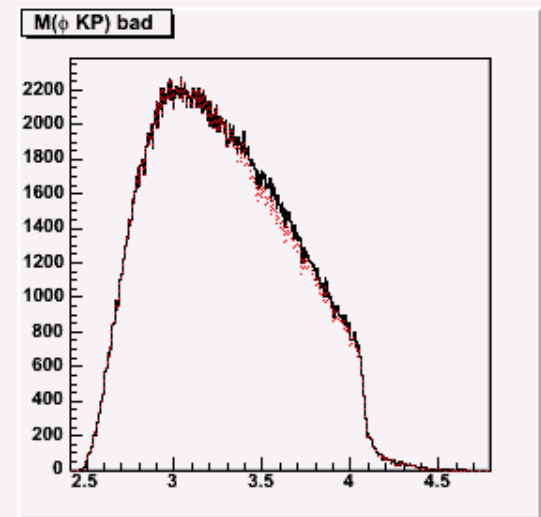
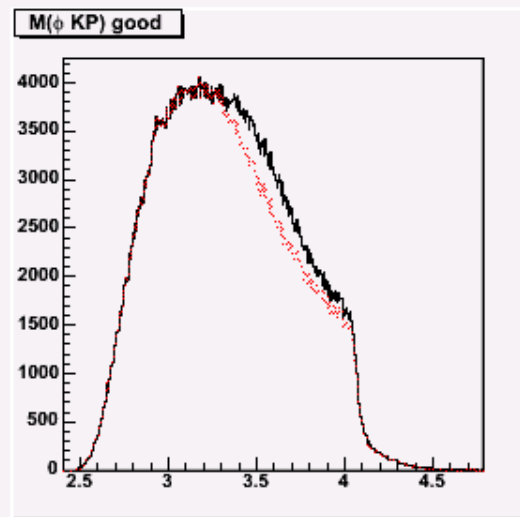
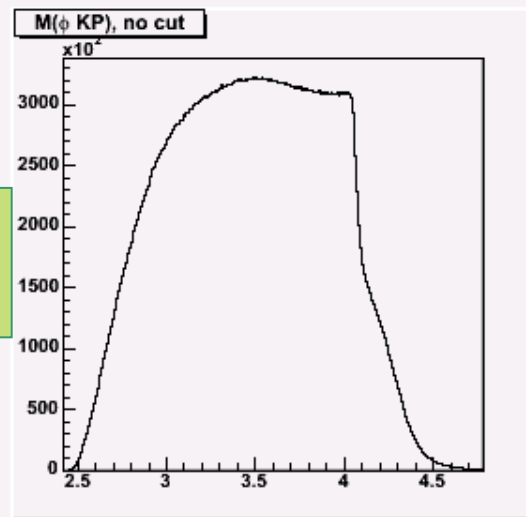
Phi K P

With and **Without** $D^0 \rightarrow K\pi$

PQ Lxy
> 550



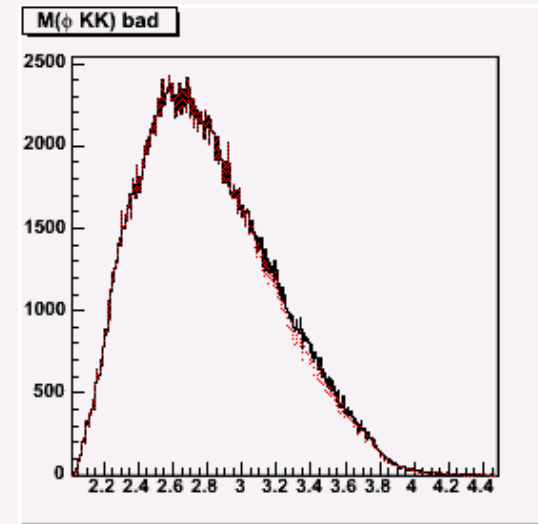
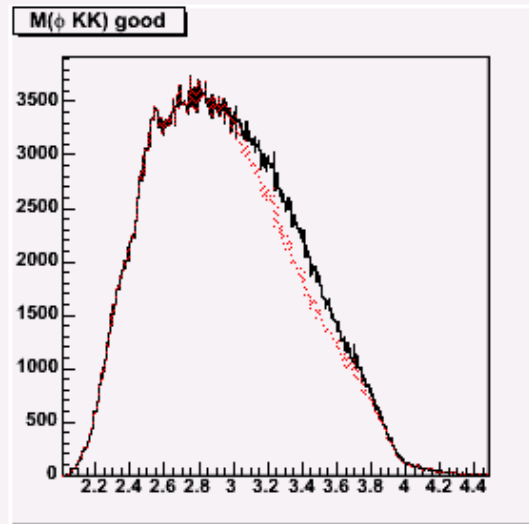
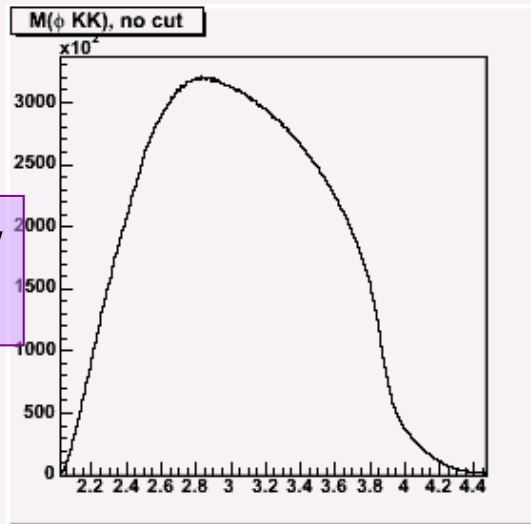
PQ Lxy
> 100



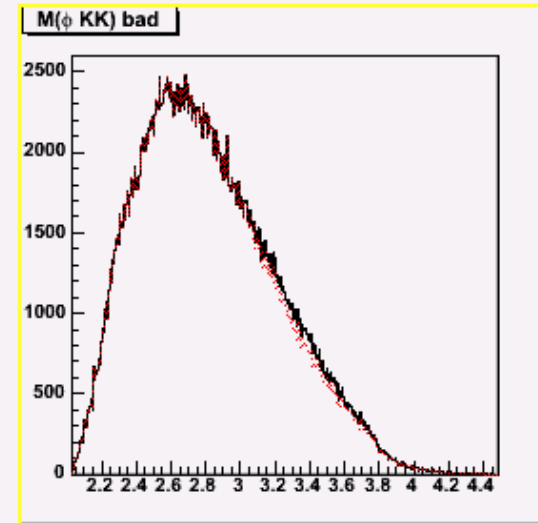
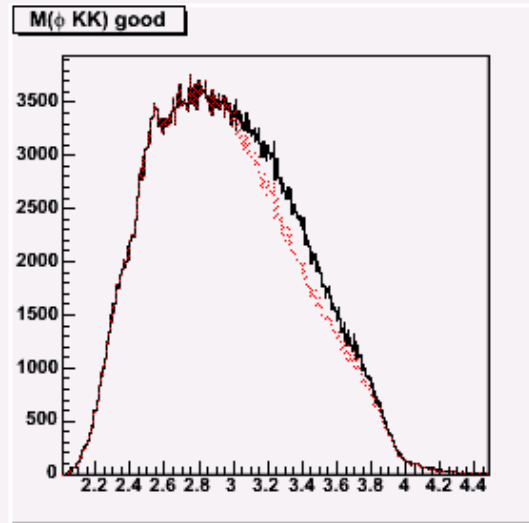
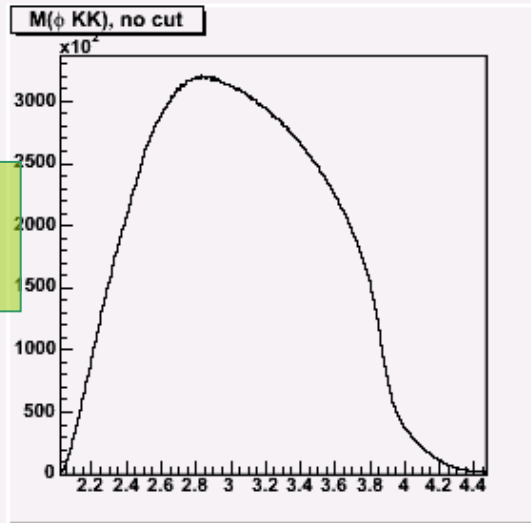
Phi K K

With and Without $D^0 \rightarrow K\pi$

PQ Lxy
> 550



PQ Lxy
> 100



Summary of study

- Checking possible decays of $\Phi + 2$ tracks
 - many contributions from decays. Will zoom in and plot decay modes individually.
- Cut optimization (Chi square and what else?) for calculation of ratio of $\text{Br}(D^0 \rightarrow K\pi)$ to $\text{Br}(D^0 \rightarrow \pi\pi)$
- Reference of DsP : $D^* \rightarrow D(\rightarrow K\pi)P$ will be ready.
- Clean cut – default cut. Put clean cut in ntuple process (will be ready in few days)
- Will select only one good candidate/event by using momentum selection or PID comparison.